

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A submount comprising:

a submount substrate; and

a solder layer comprising at least a first metal and a second metal in a specific mass ratio

formed on a primary surface of said submount substrate,

wherein the relative density of said solder layer before melting is at least 50% and no more than 99.9% of the theoretical density of ~~the material used in~~ said solder layer.

2. (Previously Presented): A submount as described in claim 1 wherein said solder layer contains at least one of the following: gold-tin alloy, silver-tin alloy, and lead-tin alloy.

3. (Previously Presented): A submount as described in claim 1 wherein said solder layer before melting is formed on said submount substrate and includes a first layer containing silver and a second layer, formed on said first layer, containing tin.

4. (Original): A submount as described in claim 1 further comprising an electrode layer formed between said submount substrate and said solder layer.

- 5 (Original): A submount as described in claim 4 wherein said electrode layer contains gold.

6. (Previously Presented): A submount as described in claim 4 further comprising a solder adhesion layer formed between said solder layer and said electrode layer;

wherein said solder adhesion layer contains: a noble metal layer disposed on said solder

layer side and containing at least one of the following: gold, platinum, palladium, and alloys thereof; and a transition element layer disposed on said electrode layer side and containing at least one of the following: titanium; vanadium; chromium; zirconium; niobium; and alloys thereof.

7. (Previously Presented): A submount as described in claim 1 further comprising an adhesion layer and a diffusion barrier layer formed between said submount substrate and said solder layer;

wherein

said adhesion layer is formed to contact said primary surface of said submount substrate;

and

said diffusion barrier layer is formed on said adhesion layer.

8. (Original): A submount as described in claim 7 wherein said adhesion layer contains titanium and said diffusion barrier layer contains platinum.

9. (Previously Presented): A submount as described in claim 1 wherein said submount substrate contains sintered aluminum nitride or sintered alumina.

10. (Previously Presented): A semiconductor device comprising:

a submount as described in claim 1; and

a semiconductor light-emitting element mounted on said solder layer of said submount.

11. (New) The submount as described in claim 1, wherein said first metal is gold and said gold

is either at least 65% by mass and no more than 85% by mass, or at least 5% by mass and no more than 20% by mass of said solder layer.

12. (New) The submount as described in claim 1, wherein said first metal is silver and said silver is no more than 72% by mass of said solder layer.

13. (New) A submount comprising:

a submount substrate; and

a solder layer comprising at least a first metal and a second metal in a specific mass ratio formed on a primary surface of said submount substrate,

wherein said solder layer is formed using a solder film-formation rate of at least 1.3 nm/sec so that the relative density of said solder layer before melting is at least 50% of the theoretical density of said solder layer.

AMENDMENTS TO THE DRAWING

Figure 4 has been amended to clearly designate the respective figure as prior art. No new matter has been added.

The replacement sheet replaces all previous drawing sheets.

Attachment A: Figure 4